INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 2005	**Park:** Shenandoah NP
Principal Investigator: John Skelly	**Office Phone:** 540 854-7099 **Email:** jms34@psu.edu
Address: 5316 Wyndemere Circle Mineral, VA 23117 USA	**Office Fax:** same

Additional investigators or key field assistants (first name, last name, office phone, office email):

No co-investigators

Permit#:
SHEN-2005-SCI-0012

Park-assigned Study Id. #:
SHEN-00319

Project Title:
Common and Tall Milkweed as bioindicators of ozone air pollution: NASA/GLOBE educational program "Surface Ozone Measurements and Using Sensitive Plants as Bioindicators of Ozone Air Pollution"

Permit Start Date: Oct 10, 2005	**Permit Expiration Date** Nov 30, 2006
Study Start Date: Oct 10, 2005	**Study End Date** Nov 30, 2006

Study Status:
Continuing

Activity Type:
Education

Subject/Discipline:
Air Pollution Effects

Objectives:

Tropospheric ozone air pollution has been well-documented for its excessive concentrations at the higher elevations within the SHEN on an every summer season basis. Since the 1970's many foliar symptoms have been reported to occur on sensitive plant species including both tall (Asclepias exaltata) and common (Asclepias syriaca) milkweed. Several clonal populations of these two bioindicator species appear to be very sensitive to ozone exposures within the Big Meadows area of the SHEN. The consistently high ozone exposures at Big Meadows continues to reveal the presence of known sensitive (as observed by J.M. Skelly in August, 2005) ozone-induced symptomatic clones of both milkweed species.

The purpose of the Permit Application is to simply collect viable seeds and rhizomes of known ozone-sensitive tall and common milkweed specimens within the high elevation Big Meadows area of the SHEN. Seeds and clonal propagation from rhizomes will take place outside of the Park with emerging plantlets and new rhizomes being grown for use within a NASA sponsored project (GLOBE)-Global Learning and Observations that Benefit the Environment: "Surface Ozone Measurements and Using Sensitive Plants as Bioindicators of Ozone Air Pollution". This is a national and international project offering education for elementary and high school teachers and their students to learn of the effects of ozone air pollution on ozone-sensitive plant life. A similar collection for the NASA/GLOBE project involving cut-leaf coneflower (Rudbeckia lacinata) is taking place within the GSMNP, Ms. Susan Sachs cooperator, NPS.

Seed pod collections will be made from no more than 5 symptomatic plants of each species; 5 robust rhizomes are requested to be collected from the soils within the center of no more than 5 selected spreading clones of each symptomatic species. Propagation will take place within a bioindicator garden with plant distributions made to participating schools through the NASA/GLOBE program.

Findings and Status:

Seeds of common and tall milkweed were collected from native plants at three locations within the Big Meadows area of the SHEN. The seed source plants had been determined to be symptomatic of ozone-induced foliar injury at the time of collection, November 17,2005. Seeds were cleaned and have been stored dry within sealed plastic bags in a refrigerator at the PI's facilities. Germination tests and planting will commence in the spring, 2006. Seedling plants will be available for the participants within the NASA/GLOBE-Surface Ozone Project for teacher and student education during the late spring/summer 2006. Rhizome collections for vegetative propagation of the sensitive clones will take place in the spring 2006.

For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?	
Yes	
Funding provided this reporting year by NPS:	**Funding provided this reporting year by other sources:**
0	1500
Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college	
Full name of college or university:	**Annual funding provided by NPS to university or college this reporting year:**
n/a	0